

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A magnetic resonance imaging system comprising:

MT-pulse applying means for applying to an object an MT (magnetization transfer) pulse formed as an RE (radio frequency) pulse of an off-resonance frequency to a region to be imaged of duration less than 10 ms, and of a waveform based on either a Sinc function or a Gaussian function ~~pulse of which is off resonance to a region to be imaged of the object;~~

spoiler applying means for applying a gradient spoiler pulse to the object after applying the MI pulse ~~is applied~~ to the region to be imaged; and

scanning means for performing a scan to acquire an echo signal from the region to be imaged after applying the gradient spoiler pulse ~~is applied~~;

~~wherein a duration of the MT pulse is set to a short time.~~

2. Cancelled.

3. (Currently Amended) The magnetic resonance imaging system according to claim 220, wherein the duration of the MT pulse is 6 ~~{msec}~~ms or less.

- 4-5. Cancelled.

6. (Currently Amended) The magnetic resonance imaging system according to claim ~~1~~20, wherein the scanning means is configured to ~~two dimensionally scan the region to be imaged on the basis of~~ a two-dimensional scan performed based on a multi-slice imaging technique.

7. (Currently Amended) The magnetic resonance imaging system according to claim ~~1~~20, wherein the scanning means is configured to ~~three dimensionally scan the region to be imaged on the basis of~~ a three-dimensional scan performed based on a multi-slice imaging technique.

8. (Currently Amended) The magnetic resonance imaging system according to claim 7, further comprising region selecting means unit configured to apply, concurrently with the application of the MT pulse, a gradient pulse to select an applied position of the MT pulse to the object so that the applied position of the MT pulse is different from the region to be imaged.

9. (Currently Amended) ~~A~~The magnetic resonance imaging system comprising: according to claim 1

~~MT pulse applying means for applying to an object an MT pulse of which is off-resonance to a region to be imaged of the object;~~

~~spoiler applying means for applying a gradient spoiler pulse to the object after the MT pulse is applied; and~~

~~scanning means for performing a scan to acquire an echo signal from the region to be imaged after the gradient spoiler pulse is applied; wherein a~~the duration of the MT pulse is set to

a ~~short~~period of time during which relaxation of a spin-lattice magnetization of amagnetic spins
ofin the object is ~~hardly~~substantially not completed.

10. Cancelled.

11. (Currently Amended) The magnetic resonance imaging system according to
claim 10~~9~~, wherein the scanning means is configured to two dimensionally scan the region to be
imaged on the basis of two-dimensional scan performed based on a multi-slice imaging
technique.

12. (Currently Amended) The magnetic resonance imaging system according to
claim 10~~9~~, wherein the scanning means is configured to three dimensionally scan is a three-
dimensional scan performed based on the region to be imaged on the basis of a multi-slice
imaging technique.

13. (Original) The magnetic resonance imaging system according to claim 12, further
comprising region selecting means configured to apply, concurrently with the application of the
MT pulse, a gradient pulse to select an applied position of the MT pulse to the object so that the
applied position of the MT pulse is different from the region to be imaged.

14. (Currently Amended) A magnetic resonance imaging method for acquiring an
echo signal on the basis of magnetic resonance phenomena of at least two types of nuclear pools
in an object, the two types of nuclear pools being mutually coupled ~~through~~through a coupling
relationship based on at least one of ach chemical exchange phenomenon and a cross relaxation
phenomenon, the method comprising the steps of:

decoupling the coupling relationship between the at least two types of nuclear pools by applying to the object an MT ~~pulse of which duration is short~~(magnetization transfer) pulse formed as an RF (radio frequency) pulse of an off-resonance frequency to a region to be imaged, of duration less than 10 mc, and of a waveform based on either a Sinc function or a Gaussian function;

applying a gradient spoiler pulse to the decoupled nuclear pools; and

acquiring the echo signal from a region to be imaged of the object.

15. (Original) The magnetic resonance imaging method according to claim 14, wherein the two types of nuclear pools consist of a nuclear pool of free water and a nuclear pool of a macromolecule.

16. (Currently Amended) The magnetic resonance imaging method according to claim 15, wherein the echo signal from the region to be imaged is acquired by a two-dimensional scan performed based on a multi-slice imaging technique.

17. (Currently Amended) The magnetic resonance imaging method according to claim 15, wherein the echo signal from the region to be imaged is acquired by a three-dimensional scan performed based on a multi-slice imaging technique.

18. (Original) The magnetic resonance imaging method according to claim 17, wherein, concurrently with the application of the MT pulse, a gradient pulse is applied to the object so as to select an applied position of the MT pulse to the object so that the applied position of the MT pulse is different from the region to be imaged.

19. Cancelled.

20. (New) A magnetic resonance imaging system comprising:

an MT-pulse applying unit configured to apply to an object an MT (magnetization transfer) pulse formed as an RF (radio frequency) pulse of an off-resonance frequency to a region to be imaged of duration less than 10 mc, and of a waveform based on either a Sinc function or a Gaussian function;

a spoiler applying unit configured to apply a gradient spoiler pulse to the object after applying the MT pulse to the region to be imaged; and

a scanning unit configured to perform a scan to acquire an echo signal from the region to be imaged after applying the gradient spoiler pulse to the object.